

Identifying High-Opportunity Areas to Strengthen Clinical Trial Access in a National Cancer Institute (NCI) Cancer Center Catchment Area

D. Antonio, T. Manning, M. Gurley, C. Passaglia

Robert H. Lurie Comprehensive Cancer Center of Northwestern University

1. Background

Ensuring that clinical trial enrollment reflects both patient populations and research capacity is a core mission of NCI-Designated Cancer Centers. Yet geographic, structural, and disease-related barriers can limit participation across catchment areas.

2. Goals

To inform institutional planning, we developed a Clinical Trial Opportunity Index using aggregated patient-level data to identify Zone Improvement Plan (zip) codes where trial access could be strengthened and evaluated geographic patterns and predictors of these high-opportunity locations within the Lurie Comprehensive Cancer Center's (LCC) catchment area.

3. Solutions and Methods

Northwestern Medicine (NM) tumor registry data were linked with clinical trial enrollment records to create a unified analytic dataset of cancer cases diagnosed between 2018–2024. Given the LCC's integration within the NM cancer network, we included cases from all NM locations to fully represent where patients receive care and how they connect back to the catchment area. Patient-level data were aggregated to zip code at diagnosis to characterize case volume, demographic distributions, cancer site mix, enrollment volume, enrollment within 30 days of diagnosis, NM regional network distribution, and average drive time to treatment sites. The Clinical Trial Opportunity Index was calculated as the average of two scaled and log-transformed components: the difference between case volume and trial enrollment volume, and the inverse enrollment rate. Spatial autocorrelation was assessed using Moran's I, and a multivariable spatial lag model was used to account for spatial dependence and identify predictors of high-opportunity locations.

4. Outcomes

High-opportunity zip codes were spatially clustered across all NM regions outside the central subregion where the LCC is located. Significant spatial dependence in opportunity scores was detected ($\rho = 0.19$, 95 percent Confidence Interval [CI]: 0.07–0.32; $p = 0.002$). Zip codes with lower proportions of cases from the NM central subregion had substantially higher opportunity scores ($\beta = 0.17$, 95 percent CI: 0.11–0.22; $p < 0.001$). Higher opportunity was also observed in zip codes with a greater proportion of lung cancer cases ($\beta = 1.00$, 95 percent CI: 0.64–1.35; $p < 0.001$) and uterine cancer cases ($\beta = 0.66$, 95 percent CI: 0.03–1.29; $p = 0.039$). Longer mean drive time ($\beta \approx -0.001$ per minute; $p = 0.011$) and higher timely enrollment were associated with lower opportunity scores ($\beta = -0.09$, 95 percent CI: -0.17 to -0.01 ; $p = 0.037$). The spatial model explained 50 percent of overall variation ($R^2 = 0.502$) with a strong fit (AIC = -461 ; $n = 304$ zip codes). After adjusting regional case distribution, patient demographic characteristics did not significantly predict opportunity scores.

5. Lessons Learned and Future Directions

Leveraging linked registry and clinical trial data, we identified geographic clusters of zip codes that represent high-opportunity areas for strengthening clinical trial engagement across the catchment area. These areas were in non-central regions, had a longer time to enrollment, and experienced a higher lung and uterine cancer burden. This framework provides a pragmatic, data-driven approach to guide

Category: Clinical Research and Access Through a Catchment Lens – Completed Project – Staff

outreach, trial placement, and resource allocation to strengthen clinical trial access across the catchment area.